In 1830 a most perceptive young Frenchman, Alexis de Tocqueville, made the observation that Americans established associations to do a variety of very important things. He said, "Wherever at the head of some new undertaking you see the government in France or a man of rank in England, in the United States you will be sure to find an association." It is apparent that in recent years in the United States there has been a trend away from this. More and more we are inviting the government to take on some of the activities of our independent associations, which seem unable to recognize their own potential for significant accomplishment.

The physicians of California are given the challenge by Dr. Lovett of unmet needs and unsolved problems of many of our California institutions of higher education. He quite properly emphasizes that the greatest impact can be provided by personal involvement of individual physicians in their local colleges and universities.

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Coronary Arteriography: Where? When?

THE PAPER IN THIS ISSUE by Selzer, Anderson and March, "Indications for Coronary Arteriography," presents a contemporary summary of the risks and benefits of coronary arteriography. The authors have examined the risks in relation to the experience of the diagnostic laboratory. They also have raised pertinent questions about the widespread application of coronary arteriography when this is done outside the context of sophisticated radiological and physiological interpretation and a surgical team evaluating the collective results of what is at present experimental surgery.

The standards for laboratories and hospitals performing diagnostic hemodynamic and angiographic studies have evolved from numerous publications and the recommendations of the American Heart Association. These reports have pointed out the higher incidence of complications when such procedures are done infrequently. The information presented by Selzer et al again emphasizes the significantly greater morbidity and mortality in laboratories performing a limited number of diagnostic studies.

Regrettably, many community hospitals have generated hemodynamic and angiographic laboratories, as well as open-heart surgery teams, which must be regarded more as status symbols than services required because of a significant case load and the lack of alternative diagnostic and surgical resources.

The laboratory that performs few studies operates less safely for a number of reasons. Procedures are apt to be protracted because of the inexperience of the technical personnel. There may be equipment faults because the instruments have lain fallow for several weeks, or because the size of the operation does not justify employment of a technician to test and troubleshoot the electronic systems. The isolated diagnostic laboratory that has no supporting surgical team operates at a particularly unsafe disadvantage because occasional complications during study require immediate surgical intervention.

The lower complication rate of laboratories with high case loads is not necessarily related to the level of training of the persons performing the procedures, but is probably more directly the result of repetitive practice afforded by a large number of studies. The complication rate at the University of Oregon Medical School, for example, is as low as that of other medical centers studying a large number of patients, although most of the procedures are done by trainees under staff supervision.

If the risk of coronary arteriography is to be minimized, the procedures should be done in a laboratory that performs a number of studies sufficient to maintain the technical facility of the operator and his assistants. This probably requires three or more angiographic studies per week and a collateral open-heart surgery load of at least two cases weekly.

The development of coronary arteriographic techniques and the successful results of revascularization and coronary bypass surgery have caused enormous pressure on medical centers to perform diagnostic studies and surgery. Examples of immediate symptomatic improvement after aortocoronary bypass surgery are quite impressive, but the rate of surgical failure is still

significant, and the collective evidence is thus far inadequate to determine the effect on survival and prevention of myocardial infarction. In view of these uncertainties, it is particularly illogical to consider coronary arteriography in all patients with coronary artery disease in order to screen for operability.

Selzer et al state indications for coronary arteriography which are appropriate to current diagnostic and surgical extrapolations. There is no doubt that arteriography discriminates coronary arteriosclerosis in most instances in which it is present, and provides precise quantitation of the disease when the diagnosis is in question, or when the disability under medical treatment is sufficient to warrant surgical consideration. Coronary visualization before valvular surgery in older patients has contributed to more accurate assessment of the risk and has aided the surgical planning. And even though the final results are unknown, the mortality and morbidity risks after myocardial infarction in young patients are high enough to justify arteriography in evaluation for coronary surgical procedures.

No doubt the indications defined by Selzer et al will change along with experience and the wider collection of objective data evaluating coronary surgery. Until many questions are answered, these would seem to be reasonable current guidelines.

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Medical Education in Transformation

MOST PRACTICING PHYSICIANS are aware that profound changes are taking place in medical education, but comparatively few must know the extent of these changes or be aware that they are occurring with relatively little understanding on the part of anyone as to where they are likely to lead. There can be little doubt that medical education is once again undergoing transformation, only this time apparently without any such clear purpose as that which followed the Flexner Report in 1910.

What is occurring is a reflection of both the character of the times and of enormous expansion in the amount of medical knowledge. Many new factors have come into play. There is a new positive emphasis on health and avoidance of disease which cannot but influence medical education. There is much more attention being given to cultural backgrounds of both students and patients, to overcoming "racism" in medical school and medical care, and to what is called "affirmative action" which seeks to ensure that the population of the medical school student-body more nearly reflects the cultural composition of the population to be served in practice. The idea that education should satisfy one's own personal needs rather than fulfill anyone else's prescribed norms, something generally accepted at the college level, is now making its appearance in medical education.

This is beginning to challenge and even erode the idea that there is a basic body of professional knowledge which all physicians must have learned and which has been a principal basis for the trust his patients and others place in him when they seek his advice. Active student participation in administrative decision-making at all levels of the educational process is the order of the day in medical schools, and this can be time consuming. Medical school curricula have been changing dramatically in an effort to respond to demands for a shorter time in training and greater flexibility in scholarship and content. And not the least of these new factors transforming medical education is the government, which by both accident and design is exercising a most profound influence for better or for worse.

The evidence leaves no doubt that a very basic transformation in medical education is well under way. But the evidence also suggests that what is happening is dangerously lacking in clear purpose or direction. For example, there is no clear consensus as to just what medical education in its new form is to accomplish. In fact there is no clear perception of just what tomorrow's physician will be doing and thus for what